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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,277	10/09/2001	Ann Witvrouw	00-1092-A	5789

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MCDONNELL BOEHNEN HULBERT & BERGHOFF
300 SOUTH WACKER DRIVE
SUITE 3200
CHICAGO, IL 60606

EXAMINER

PERKINS, PAMELA E

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/973,277

Applicant(s)

WITVROUW ET AL.

Examiner

Pamela E Perkins

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other:

DETAILED ACTION

This office action is in response to the filing of the application papers on 9 October 2001. Claims 1-23 are pending.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuke (EP 658927).

Kuke discloses a method of producing micromachined devices where at least one micromachined device is processed from a crystalline silicon wafer (1), with a front plane and a back plane, wherein the micromachined device comprises at least one elongated opening (3). Kuke further discloses the opening (3) having a longitudinal axis, so that an angle is formed by the longitudinal axis and a line formed by an intersection of the front plane of the wafer (1) and a cleavage plane, a plane along which cleavage of the wafer (1) is most likely to occur (abstract; Fig. 1). Kuke also discloses the wafer (1) as a circular disc with at least one part off along a chord of the wafer being flat (4) to the wafer, wherein the flat (4) may be parallel to the intersection. Kuke discloses the front and back planes of the wafer having an orientation in the {100}

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family and the cleavage plane having an orientation in the {110} or {111} family (description).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuke in view of Imaizumi et al. (4,278,987).

Kuke discloses a method of producing micromachined devices where at least one micromachined device is processed from a crystalline silicon wafer (1), with a front plane and a back plane, wherein the micromachined device comprises at least one elongated opening (3). Kuke further discloses the opening (3) having a longitudinal axis, so that an angle is formed by the longitudinal axis and a line formed by an intersection of the front plane of the wafer (1) and a cleavage plane, a plane along which cleavage of the wafer (1) is most likely to occur (abstract; Fig. 1). Kuke also discloses the wafer (1) as a circular disc with at least one part off along a chord of the wafer being flat (4) to the wafer, wherein the flat (4) may be parallel to the intersection. Kuke discloses the front and back planes of the wafer having an orientation in the {100} family and the cleavage plane having an orientation in the {110} or {111} family (description). Kuke does not disclose the angle as less than 45°.

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Imaizumi et al. disclose a method of producing micromachined devices where an opening is formed in a silicon wafer, wherein the opening has an orientation in the {110} or {111} family and the wafer having an orientation in the {100} family. Imaizumi et al. further disclose forming the opening at angle of less than 45° to the wafer (Fig. 6; col. 4, lines 3-32; col. 9, lines 36-44).

Since Kuke and Imaizumi et al. are both from the same field of endeavor, a method of producing micromachined devices, the purpose disclosed by Imaizumi et al. would have been recognized in the pertinent art of Kuke. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to modify Kuke by having the angle as less than 45° as taught by Imaizumi et al. so the opening suitable for a high voltage device (col. 4, lines 3-15).

Claims 9, 12, 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuke in view of Izuha et al. (6,440,616).

Kuke discloses a method of producing micromachined devices where at least one micromachined device is processed from a crystalline silicon wafer (1), with a front plane and a back plane, wherein the micromachined device comprises at least one elongated opening (3). Kuke further discloses the opening (3) having a longitudinal axis, so that an angle is formed by the longitudinal axis and a line formed by an intersection of the front plane of the wafer (1) and a cleavage plane, a plane along which cleavage of the wafer (1) is most likely to occur (abstract; Fig. 1). Kuke also discloses the wafer (1) as a circular disc with at least one part off along a chord of the wafer being flat (4) to the wafer, wherein the flat (4) may be parallel to the intersection.

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Kuke discloses the front and back planes of the wafer having an orientation in the {100} family and the cleavage plane having an orientation in the {110} or {111} family (description). Kuke does not disclose subjecting the wafer to a photolithography process using a rotating mask.

Izuha et al. disclose a method of producing semiconductor devices where a silicon wafer is subjected to a photolithography process to pattern the wafer through a mask, and then etching the wafer. Izuha et al. further disclose rotating the mask over the wafer (col. 4, line 36 thru col. 5, line 20).

Since Kuke and Izuha et al. are both from the same field of endeavor, a method of producing semiconductor devices, the purpose disclosed by Izuha et al. would have been recognized in the pertinent art of Kuke. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to modify Kuke by subjecting the wafer to a photolithography process using a rotating mask as taught by Izuha et al. to improve the precision of the photolithography process (col. 3, lines 9-24).

Claims 10, 11, 13, 14, 16, 17 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuke in view of Izuha et al. as applied to claims 1-5, 7, 9, 12, 15 and 18 above, and further in view of Marinaro et al. (6,245,584).

Kuke discloses a method of producing micromachined devices where at least one micromachined device is processed from a crystalline silicon wafer (1), with a front plane and a back plane, wherein the micromachined device comprises at least one elongated opening (3). Kuke further discloses the opening (3) having a longitudinal axis, so that an angle is formed by the longitudinal axis and a line formed by an

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intersection of the front plane of the wafer (1) and a cleavage plane, a plane along which cleavage of the wafer (1) is most likely to occur (abstract; Fig. 1). Kuke also discloses the wafer (1) as a circular disc with at least one part off along a chord of the wafer being flat (4) to the wafer, wherein the flat (4) may be parallel to the intersection. Kuke discloses the front and back planes of the wafer having an orientation in the {100} family and the cleavage plane having an orientation in the {110} or {111} family (description). Kuke in view of Izuha et al. do not disclose the photolithography process comprising a contact printing step, a proximity printing step or a number of projection printing steps.

Marinaro et al. disclose a method of processing micromachined devices where a photolithography process is performed on a wafer. Marinaro et al. further disclose the photolithography process comprising a contact printing step, a proximity printing step or a number of projection printing steps (col. 1, lines 7-65).

Since Kuke and Marinaro et al. are both from the same field of endeavor, a method of producing micromachined devices, the purpose disclosed by Marinaro et al. would have been recognized in the pertinent art of Kuke. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to modify Kuke by the photolithography process comprising a contact printing step, a proximity printing step or a number of projection printing steps as taught by Marinaro et al. so to not underexpose the wafer (col. 1, lines 46-65).

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuke in view of Liu et al. (6,213,050).

Kuke discloses a method of producing micromachined devices where at least one micromachined device is processed from a crystalline silicon wafer (1), with a front plane and a back plane, wherein the micromachined device comprises at least one elongated opening (3). Kuke further discloses the opening (3) having a longitudinal axis, so that an angle is formed by the longitudinal axis and a line formed by an intersection of the front plane of the wafer (1) and a cleavage plane, a plane along which cleavage of the wafer (1) is most likely to occur (abstract; Fig. 1). Kuke also discloses the wafer (1) as a circular disc with at least one part off along a chord of the wafer being flat (4) to the wafer, wherein the flat (4) may be parallel to the intersection. Kuke discloses the front and back planes of the wafer having an orientation in the {100} family and the cleavage plane having an orientation in the {110} or {111} family (description). Kuke does not disclose using the micromachined devices in a Microelectromechanical system (MEMS).

Liu et al. disclose a method of producing micromachined devices where the micromachined devices in a MEMS (col. 1, lines 7-45).

Since Kuke and Liu et al. are both from the same field of endeavor, a method of producing micromachined devices, the purpose disclosed by Liu et al. would have been recognized in the pertinent art of Kuke. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to modify Kuke by using the micromachined devices in a MEMS as taught by Liu et al. to have a wider range of applicability (col. 1, lines 35-38).

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pamela E Perkins whose telephone number is (703) 605-4299. The examiner can normally be reached on Monday thru Friday, 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (703) 308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

pep
April 3, 2003


AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800